

REMARKS/ARGUMENTS

Claims 1-22 are active in this application. Support for Claims 15-22 is found in the specification on page 19, pages 4-5, and page 13. The remaining claims are amended for grammatical clarity. Claims 3-14 are drawn to the elected subject matter. Applicants also request that Claims 15-22 be included in those elected claims and consider rejoinder of the non-elected method claims, 1 and 2, upon finding the elected product claims allowable (MPEP 821.04).

Claims 3-14 directed to dental bleaching agents have been rejected as being obvious in view of Ishibashi et al. and Morikawa et al. The rejection is respectfully traversed as the combination of cited prior art references do not describe the advantages of using nitrogen-doped titanium dioxide in terms of high catalytic activity in response to exposure to visible light.

As described in the specification in the paragraph bridging pages 4-5, titanium dioxide exhibits substantially no catalytic action in visible light but requires ultraviolet light for the catalytic action. However, ultraviolet light is not good for humans and is not suitable for long-term radiation in the oral cavity. Thus, as described in the paragraph bridging pages 6 and 7, nitrogen doped titanium dioxide exhibits high catalytic activity when exposed to visible light when compared to titanium dioxide. Therefore, the bleaching effect caused by nitrogen-doped titanium dioxide is very high as shown in the data presented on page 30, Table 14. Further details follow.

Ishibashi describes dental bleaching compositions comprising a titanium dioxide, a hydrogen peroxide-generating compound, and a thickening agent, that can be photoactivated by light. Morikawa describes a photocatalytic material comprising a Ti-O-N structure (“nitrogen-doped titanium oxide”) that exhibits photocatalytic activity when exposed to

visible light. The Examiner alleges that it would have been obvious to employ the nitrogen-doped titanium oxide composition taught by Morikawa in Ishibashi's bleaching composition and method.

While Morikawa describes that Ti-O-N photocatalytic material has improved photocatalytic activity, Morikawa does not describe that the this photocatlytic material could be used on teeth for bleaching the same. Moreover, the data presented in the specification demonstrates formulations containing nitrogen-doped titanium oxide powders (3 plus marks, Table 1) yield very high bleaching effects on teeth when compared to the Comparative Example 1 containing a undoped titanium oxide (as in Ishibashi) (1 plus mark, Table 13)—note the description of the symbols “+” and “+++” is found on page 29 of the specification.

Moreover, as stated by the Applicants on page 32:

It was confirmed as apparent from the foregoing results that the method for bleaching teeth and the bleaching agent for teeth according to the present invention exerted high bleaching effect even with irradiation of visible light, and thus bleach of teeth could be carried out by using no hydrogen peroxide in a high concentration exceeding 30% by weight as in Comparative Example 2.

These advantages and improvements are also not described or suggested by the combination of cited references. Accordingly, withdrawal of this rejection is requested.

Claims 3-14 are provisionally rejected under obviousness-type double patenting in view of claims 1-13 of the co-pending application No. 10/791, 783. Applicants request that the rejection be held in abeyance since the alleged conflicting claims have not yet been patented (MPEP § 822.01).

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Applicants also request allowance of all pending claims.

Respectfully submitted,

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